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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/870,524	05/30/2001	Tomoki Kobayashi	IIW-002	1359
959	7590	05/12/2004	EXAMINER	
LAHIVE & COCKFIELD, LLP. 28 STATE STREET BOSTON, MA 02109			CREPEAU, JONATHAN	
			ART UNIT	PAPER NUMBER
			1746	
DATE MAILED: 05/12/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

AS

Office Action Summary

Application No.

09/870,524

Applicant(s)

KOBAYASHI ET AL.

Examiner

Jonathan S. Crepeau

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 April 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11, 13, 17 and 18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11, 13, 17 and 18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 23, 2004 has been entered.

This Office action addresses claims 1-11, 13, 17 and 18. Although the claims have been amended, they remain rejected for substantially the reasons of record. This action is non-final.

Claim Rejections - 35 USC § 103

2. Claims 1-11, 13, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Voss et al (U.S. Patent 6,106,964) in view of Reiser (U.S. Patent 6,497,971).

Regarding claims 1, 13, 17, and 18, Voss et al. is directed to a method for controlling the temperature of an oxidant supply gas to be supplied to a fuel cell (see col. 4, line 11). The method comprises the step of introducing the supply gas into a heat exchanger, and at the same time, introducing an exhaust gas discharged from the fuel cell into the heat exchanger to perform heat exchange between the gases (see col. 4, lines 15-28; Fig. 2). Regarding claim 8, the reference teaches that the heat exchanger is a water-permeable membrane type humidifier (see col. 5, lines 32-52).

Voss et al. do not expressly teach a compressor functioning as a temperature control device located downstream of the fuel cell which compresses the exhaust gas, as recited in claims 1, 13, 17, and 18.

The patent of Reiser is directed to a fuel cell assembly in which blowers (i.e., compressors) 17A, B are located downstream of the cell stacks and suck oxidant reactant therethrough (see Fig. 6; col. 7, lines 19-24).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the fuel cell assembly of Reiser in the system of Voss et al. In column 2, line 26, Reiser teaches that an object of his invention is "to provide improved methods and apparatus for the delivery of input reactants to fuel cells." Accordingly, the artisan would be motivated to use the fuel cell assembly of Reiser in the system of Voss et al. Regarding claims 13, 17, and 18, the blowers of Reiser would inherently function to control (i.e., increase) the temperature of the oxidizing exhaust gas of Voss et al. before it is introduced into the heat exchanger. Further, the disclosure of Reiser that the blowers "pull" oxidant through the fuel cell fairly suggests that the supply gas has a negative pressure and that the exhaust gas has a higher pressure than the supply gas, as recited in claims 1, 13, 17, and 18.

Regarding instant claims 2 and 9, which recite that a controller controls the pressure of the exhaust gas to be incorporated into the heat exchanger, the blower of Reiser would also inherently perform this function. Regarding claims 3 and 4, which recite that the controller is controlled depending on the "demand" temperature of the supply gas, Reiser also fairly suggests this limitation. Reiser teaches in column 3, line 21 that "the method can also include

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determining a temperature characteristic of the fuel cell stack assembly and controlling the blower responsive to the temperature.” The disclosed “temperature characteristic of the fuel cell stack” fairly suggests the reactant input temperatures. Accordingly, claims 3 and 4 would be rendered obvious.

Regarding claims 5 and 6, which recite that the pressure of the exhaust gas is increased when the temperature of the supply gas is lower than the demand temperature and vice versa, Reiser also fairly suggests these limitations. In column 3, line 24, the reference teaches that “the step of controlling can include increasing the flow of the oxidizer when the temperature is below approximately a selected temperature and reducing the flow rate when the temperature is above approximately a[t] selected temperature.” Since increased flow rate corresponds to increased pressure, the subject matter of claims 5 and 6 would be rendered obvious.

Regarding claim 7, the assembly of Reiser also comprises a control valve (53B, 56B; see Fig 6), which would also function to control the pressure of the exhaust gas to be incorporated into the heat exchanger of Voss.

Regarding claims 10 and 11, which recite that the pressure controller is controlled depending on the target humidity of the supply gas, Reiser also fairly suggests this limitation. In column 2, line 67, Reiser teaches that “the delivery of oxidizer [can be controlled] by the blowers responsive to the sensors. Sensors can be of several types and can include sensors for sensing temperature, voltage, current, oxygen concentration and humidity.” This would fairly suggest to the artisan that the blower can be controlled based on the humidity of the supply gas. Accordingly, the subject matter of claims 10 and 11 would also be rendered obvious.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1, 2, 8, 13, 17, and 18 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-12 of copending Application No. 09/908,204 (U.S. Pre-Grant Publication No. 2002/0034669) in view of Voss et al. The '204 application claims recite all the claim limitations except the presence of a compressor *per se*, that the compressor controls the temperature and pressure of the exhaust gas, and the presence of a membrane-type humidifier for exchanging heat and humidity between supply and exhaust streams. As noted above, Voss et al. is directed to a membrane humidifier. In column 3, line 55, Voss et al. teach that their humidifier is "a simpler and more energy efficient means for pre-heating an humidifying reactant supply streams in a solid polymer fuel cell system[s]." Accordingly, an artisan would be sufficiently motivated to use such a humidifier in the system of the '204 claims. Furthermore, the "gas-sucking means" recited in the '204 claims suggests the instantly claimed compressor and negative pressure. Such compressor would inherently perform the control of the temperature and pressure of the exhaust gas as also recited

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in the instant claims. Accordingly, the instant claims define an obvious variation of the '204 claims.

This is a provisional obviousness-type double patenting rejection.

5. Claims 1-11 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-19 of copending Application No. 09/801,312 (U.S. Pre-Grant Publication No. 2001/0021468) in view of Reiser. The '312 claims recite a water-permeable type humidifier which transfers water from an exhaust stream to a supply stream. It is not expressly recited that that heat is also transferred, but this feature would be inherent in the humidifier of the '312 claims. The '312 claims also do not recite a compressor downstream of the fuel cell or a negative pressure. However, as set forth above, Reiser fairly suggests these features, and motivates the artisan to include such a compressor in the system of the '312 claims. Accordingly, the instant claims define an obvious variation of the '312 claims.

This is a provisional obviousness-type double patenting rejection.

Response to Arguments

6. Applicant's arguments filed February 23, 2004 have been fully considered but they are not persuasive. Applicants assert that "[i]n particular, as described in Example 4 of the Voss reference, a *compressed* supply gas is used, which has a pressure that is far higher than that of

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the exhaust gas. Therefore, the Voss reference teaches *away* from the claimed invention.” In response, it is submitted that Example 4 of Voss is merely an example and is not restrictive of the broader invention. Disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments. *In re Susi*, 440 F.2d 442, 169 USPQ 423 (CCPA 1971); MPEP §2123.

Applicants further assert that “[i]n Reiser, the supply gas appears to have a pressure that is above ambient pressure, rather than a negative pressure, as described in column 2, lines 10-19.” However, it is submitted that this passage occurs in a discussion of the prior art by Reiser. Thus, Reiser teaches that *prior art* fuel cells have oxidant supplied above ambient pressure. As set forth above, the disclosure of Reiser that his invention results in the “pulling” of oxidant through the fuel cell is believed to fairly suggest the claimed limitation that the supply gas has a negative pressure. Further, the blower of Reiser would compress the gas, thereby providing for exhaust gas having a higher pressure than the supply gas.

Applicants further assert that the motivation to combine Voss and Reiser is lacking, and in particular, “the Reiser reference does not teach or suggest that the particular use of a blower would improve a heat exchange process between a supply gas and an exhaust gas, such as the heat exchange process described in Voss. The teachings of Reiser are specific to the particular system described therein.” In response, it is submitted that the Reiser reference is not required to teach the advantages obtained by Applicants. In general, it is not necessary that the prior art suggest the combination to achieve the same advantage or result discovered by applicant. *In re Linter*, 458 F.2d 1013, 173 USPQ 560 (CCPA 1972). Further, in response to Applicant’s assertion that Reiser’s teachings are specific to the system described in Reiser, Reiser teaches at

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column 2, line 26 that "it is an object of the invention to provide improved methods and apparatus for the delivery of input reactants to *fuel cells*" [emphasis added]. This teaching fairly suggests that *any* fuel cell would benefit from being modified in the way disclosed by Reiser. As such, the Examiner maintains that the motivation to modify the fuel cell of Voss is set forth in Reiser, and the rejection under 35 USC §103 is maintained.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski, can be reached at (571) 272-1302. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (703) 872-9306.

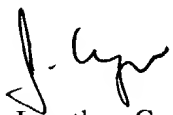
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jonathan Crepeau

Patent Examiner

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May 11, 2004